SWRMC Divers Complete Emergent Blade Change Out, Grooming on USS Stockdale

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SAN DIEGO (NNS) -- Southwest Regional Maintenance Center SWRMC divers successfully completed the replacement of a damaged control pitch propeller blade and the grooming of another blade on Arleigh Burke-class guided missile destroyer USS Stockdale (DDG 106) Jan. 3 at Naval Base San Diego.

The source of the damage to the blades is unknown and was noticed during a routine cleaning and inspection by a local contractor.

"We were requested to complete the replacement [of #1 blade] and grooming [of #5 blade] in support of the ship's upcoming deployment schedule in January," said Navy Diver 2nd Class Eric J. Stephenson, diving supervisor and diver for this job. "Normally these jobs are completed in dry dock, but there was no time to wait and our team can complete the job much cheaper and faster than dry docking."

With no time to spare, SWRMC divers immediately began coordinating with Naval Sea Systems Command (NAVSEA). NAVSEA representatives shipped a trailer to the dive team with all the tools and materials needed to complete the change out of the #1 blade.

While they waited for the trailer and new blade to arrive the dive team completed the grooming of the #5 blade, which had a dent.

"When the propeller gets a dent it ruins the hydrodynamics of the blade which will cause cavitation and ruins the blade," said Stephenson. "When we groom it, we take a file to the damaged area of the blade and we file it down to a smooth surface."

Once the trailer and new blade arrived, the team quickly got to work preparing to change out the #1 blade, which had a crack on the Prairie air system.
The Prairie air system supplies air along the propeller blade leading edge to reduce the hydrodynamic noise originating at the propeller. Masker air forms an air bubble screen around the hull of the ship, reducing transmission of machinery noise to the surrounding waters.

With cranes, rigging gear, and support equipment in place, SWRMC divers began the process of changing out the blade. NAVSEA technical representatives were on scene to assist from topside and were critical to successful completion of the job.

SWRMC divers removed the bolts that hold the blade in place and sent them to SWRMC's non-destructive testing (NDT) subject-matter experts for evaluation. Each bolt must pass an NDT inspection prior to being reattached.
Divers then proceeded to remove the blade and got an unpleasant surprise.

"When we pulled the blade off we noticed there was oil leaking into the water, so that was an immediate all stop," said Stephenson. "The initial course of action was to set the blade back down so we can regroup, set up the oil boom, and get the oil abatement team on station."

A NAVSEA technical representative determined the leak was a hub seal failure. With the newly

identified hub seal failure, divers had to acquire an entirely new work package that included the shaft seal replacement. Typically work packages take several days to complete, but Al Rehl, SWRMC subject-matter expert, was able to turn around a new package in less than 24 hours.

To prevent oil leaking during the shaft seal replacement, divers had the shaft jacked from the 12 o'clock position to the 6 o'clock position. Once the position was set divers made the necessary repairs. After completion they rotated shaft back to the 12 o'clock position and put the new blade on. The NDT approved bolts were then torqued back into place.

Despite the unplanned shaft seal replacement all repairs were completed within the prescribed period of performance, which included the New Year's holiday.

SWRMC's mission is, "Our uniquely qualified team provides superior ship maintenance, modernization and technical support to ships in the Pacific Fleet, who stand ready to fight and win."

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